

WHAT IS CLAIMED IS:

1. A substrate transfer apparatus comprising:

transfer means, having a holding member for holding a transparent substrate, for making the holding

5 member to hold the transparent substrate and

transferring the transparent substrate;

reading means having first and second parts separated from each other to optically read a pattern formed on the transparent substrate, the first part

10 being built into said transfer means; and

control means for moving the holding member so that the first and second parts have a predetermined positional relationship while the transparent substrate is being held, and making said reading means read the

15 pattern.

2. The apparatus according to 1, wherein the first part is arranged in the holding member.

3. The apparatus according to 2, wherein said reading means reads the pattern by making a reflecting

20 portion formed on an opposite surface of the

transparent substrate reflect light from an illumination portion, and making a detection portion detect the reflected light, the first part forms the reflecting portion, and the second part forms the

25 illumination portion and the detection portion.

4. The apparatus according to claim 3, wherein the reflection portion is formed by attaching a mirror to a

predetermined portion of the holding member.

5. The apparatus according to claim 3, wherein the reflecting portion is formed by attaching a white tape to a predetermined portion of the holding member.

5 6. The apparatus according to claim 3, wherein the reflecting portion is formed by mirror-finishing a predetermined portion of the holding member.

7. The apparatus according to claim 3, wherein the reflecting portion is formed by arranging a corner cube  
10 at a predetermined portion of the holding member.

8. The apparatus according to claim 3, wherein the illumination portion comprises one of an LED and a semiconductor laser.

9. The apparatus according to claim 2, wherein said  
15 reading means reads the pattern by making a detection portion detect light emitted from an illumination portion and passing through the transparent substrate, the first part forms the illumination portion, and the second part forms the detection portion.

20 10. The apparatus according to claim 9, wherein the illumination portion comprises one of an LED and a semiconductor laser.

11. The apparatus according to claim 2, wherein the second part is formed at a predetermined position  
25 associated with a transfer path of the transparent substrate transferred by said transfer means.

12. The apparatus according to claim 2, wherein the

second part is formed integrally with said transfer means so that the transparent substrate can be transferred while the first and second parts keep the predetermined positional relationship.

5 13. The apparatus according to claim 2, wherein said transfer means extracts the transparent substrate from at least two substrate containers and transfers the transparent substrate to a predetermined processing unit.

10 14. The apparatus according to claim 2, wherein the holding member comprises a pair of holding arms spaced apart at a predetermined interval, and a chucking mechanism for holding the transparent substrate by the holding arms, and the first part is incorporated in one  
15 of the pair of holding arms.

15. A semiconductor manufacturing apparatus comprising:

a substrate transfer apparatus for transferring to an exposure position a reticle obtained by forming  
20 an exposure pattern and information pattern on a transparent substrate; and

exposure means for exposing a target exposure substrate using the reticle transferred to the exposure position,

25 said substrate transfer apparatus comprising transfer means, having a holding member for holding a transparent substrate, for making the holding

member hold the transparent substrate and transferring  
the transparent substrate,

reading means having first and second parts  
separated from each other to optically read a pattern

5 formed on the transparent substrate, the first part  
being built into said transfer means, and

control means for moving the holding member so  
that the first and second parts have a predetermined  
positional relationship while the transparent substrate  
10 is being held, and making said reading means read the  
pattern.

16. A device manufacturing method comprising the  
steps of:

installing a plurality of semiconductor  
15 manufacturing apparatuses in a factory; and

manufacturing a semiconductor device using the  
plurality of semiconductor manufacturing apparatuses,

at least one of the plurality of semiconductor  
manufacturing apparatuses comprising

20 a substrate transfer apparatus for transferring  
to an exposure position a reticle obtained by forming  
an exposure pattern and information pattern on a  
transparent substrate; and

exposure means for exposing a target exposure  
25 substrate using the reticle transferred to the exposure  
position,

the substrate transfer apparatus comprising

transfer means, having a holding member for holding a transparent substrate, for making the holding member hold the transparent substrate and transferring the transparent substrate,

5        reading means having first and second parts separated from each other to optically read a pattern formed on the transparent substrate, the first part being built into the transfer means, and

10        control means for moving the holding member so that the first and second parts have a predetermined positional relationship while the transparent substrate is being held, and making the reading means read the pattern.

17.    The method according to claim 16, further  
15    comprising the steps of:

      connecting the plurality of semiconductor manufacturing apparatuses via a local area network;

      connecting the local area network to an external network outside the factory;

20        acquiring information about at least one semiconductor manufacturing apparatus from a database on the external network by using the local area network and the external network; and

      controlling the at least one semiconductor  
25    manufacturing apparatus on the basis of the acquired information.

18.    The method according to claim 17, wherein a

database provided by a manufacturer of a semiconductor device or a supplier of the manufacturing apparatus is accessed via the external network to obtain maintenance information of the semiconductor manufacturing

5 apparatus, or data communication is performed with another semiconductor manufacturing factory different from the semiconductor manufacturing factory via the external network to perform production management.

19. A semiconductor manufacturing factory comprising:  
10 a plurality of semiconductor manufacturing apparatuses;

a local area network for connecting the plurality of semiconductor manufacturing apparatus; and

a gateway for connecting the local area network  
15 and an external network outside the semiconductor manufacturing factory,

at least one of the plurality of semiconductor manufacturing apparatuses comprising

a substrate transfer apparatus for transferring  
20 to an exposure position a reticle obtained by forming an exposure pattern and information pattern on a transparent substrate; and

exposure means for exposing a target exposure substrate using the reticle transferred to the exposure  
25 position,

the substrate transfer apparatus comprising transfer means, having a holding member for

holding a transparent substrate, for making the holding member hold the transparent substrate and transferring the transparent substrate,

reading means having first and second parts  
5 separated from each other to optically read a pattern formed on the transparent substrate, the first part being built into the transfer means, and

control means for moving the holding member so that the first and second parts have a predetermined  
10 positional relationship while the transparent substrate is being held, and making the reading means read the pattern.

20. A maintenance method for a semiconductor manufacturing apparatus, comprising the steps of:

15 preparing a database for storing information about maintenance of the semiconductor manufacturing apparatus, on an external network outside a factory in which the semiconductor manufacturing apparatus is installed;

20 connecting the semiconductor manufacturing apparatus to a local area network in the factory; and

maintaining the semiconductor manufacturing apparatus on the basis of information stored in the database by using the external network and the local  
25 area network,

the semiconductor manufacturing apparatus comprising

a substrate transfer apparatus for transferring to an exposure position a reticle obtained by forming an exposure pattern and information pattern on a transparent substrate; and

5 exposure means for exposing a target exposure substrate using the reticle transferred to the exposure position,

the substrate transfer apparatus comprising transfer means, having a holding member for  
10 holding a transparent substrate, for making the holding member hold the transparent substrate and transferring the transparent substrate,

reading means having first and second parts separated from each other to optically read a pattern  
15 formed on the transparent substrate, the first part being built into the transfer means, and

control means for moving the holding member so that the first and second parts have a predetermined positional relationship while the transparent substrate  
20 is being held, and making the reading means read the pattern.